

U.S. Patent Application Serial No. 10/038,875

Response dated May 19, 2004

Reply to OA of February 20, 2004

IN THE SPECIFICATION:

Replace the table 1 beginning at page 69, line 1 as shown on the following page:

[Table 1]

	Starting material for the carbon-containing compound (D)	Skeleton section of the carbon-containing compound (B)	$(\Delta G^\circ + \Delta H^\circ)^\circ$ of the skeleton section	Inorganic acid (C)	Quantity of water (E)	Other additives	Evaluation result (1) Bending test	Evaluation (2) Conductivity at 50°C (s/cm)	Evaluation (2) Conductivity at 140°C (s/cm)	Evaluation (3) Resistance to heat at 140°C (s/cm)	Remarks
EXAMPLE 1	Bis(triethoxysilyl) octane	Octane	0	Tungstophosphoric acid	Only water of crystallization		○	3.4×10^{-2}	1.5×10^{-2}	○	
EXAMPLE 2	Bis(triethoxysilyl) hexane	Hexane	0	Tungstophosphoric acid	Only water of crystallization		○	2.2×10^{-2}	1.2×10^{-2}	○	
EXAMPLE 3	Bis(triethoxysilyl) tetradecane	Tetradecane	0	Tungstophosphoric acid	Only water of crystallization		○	1.0×10^{-2}	8.0×10^{-3}	○	
EXAMPLE 4	Bis(triethoxysilyl) ethyl benzene	Diethylbenzene	Approximately 6	Tungstophosphoric acid	Only water of crystallization		○	2.5×10^{-2}	2.0×10^{-2}	○	
EXAMPLE 5	Bis(triethoxysilyl) ethyl biphenyl	Diethylbiphenyl	Approximately 6	Tungstophosphoric acid	Only water of crystallization		○	9.7×10^{-3}	7.8×10^{-3}	○	Impurities remaining in the starting material.
EXAMPLE 6	Bis(triethoxysilyl) ethyl dimethylsiloxane	Dimethylsiloxane	Approximately 0	Tungstophosphoric acid	Only water of crystallization		○	5.8×10^{-3}	Not measured	○	High in softness
EXAMPLE 7	Bis(triethoxysilyl) octane	Octane	0	Molybdophosphoric acid	Only water of crystallization		○	3.0×10^{-2}	Not measured	○	
EXAMPLE 8	Bis(triethoxysilyl) octane	Octane	0	Tungstosillicic acid	Only water of crystallization		○	5.0×10^{-3}	Not measured	○	
EXAMPLE 9	Bis(triethoxysilyl) octane	Octane	0	Tungstophosphoric acid	Only water of crystallization	Octyltriethoxy silane	○	1.8×10^{-2}	Not measured	○	Soft
EXAMPLE 10	Bis(triethoxysilyl) octane	Octane	0	Tungstophosphoric acid	Only water of crystallization	Tetraethoxy silane	○	3.0×10^{-2}	Not measured	○	
EXAMPLE 11	Bis(triethoxysilyl) octane	Octane	0	Tungstophosphoric acid	0.1ml incorporated		○	2.8×10^{-2}	1.8×10^{-2}	○	
EXAMPLE 12	Bis(triethoxysilyl) octane	Octane	0	Tungstophosphoric acid	Only water of crystallization		○	8.7×10^{-3}	8.8×10^{-3}	○	Aged at 140°C
EXAMPLE 13	Bis(triethoxysilyl) octane	Octane	0	Tungstophosphoric acid	Only water of crystallization		○	2.3×10^{-3}	1.3×10^{-3}	○	Initial aging effected at 40°C
EXAMPLE 14	Bis(triethoxysilyl) octane	Octane	0	Tungstophosphoric acid	Only water of crystallization	Fine silica particles	○	3.8×10^{-2}	1.8×10^{-2}	○	Tungstophosphoric acid supported by silica
EXAMPLE 15	Bis(triethoxysilyl) octane	Octane	0	Tungstophosphoric acid	Only water of crystallization		○	3.7×10^{-2}	2.1×10^{-2}	○	Recoated, and cured twice
COMPARATIVE EXAMPLE 1	Bis(triethoxysilyl) tetramethylene glycol	Polytetramethylene glycol	>7	Tungstophosphoric acid	Only water of crystallization		○	1.1×10^{-1}	1.5×10^{-3}	○	Tending to decrease at high temperature
COMPARATIVE EXAMPLE 2	(Tetraethoxysilane)	Not included	Not applicable	Tungstophosphoric acid	Only water of crystallization		×	Could not be measured	Could not be measured	×	Membrane not formed
COMPARATIVE EXAMPLE 3	Bis(triethoxysilyl) octane	Octane	0	Hydrochloric acid	Water of crystallization and hydrochloric acid		×	$<10^{-4}$	Could not be measured	×	Fragile, and easily broken
COMPARATIVE EXAMPLE 4	Octyltriethoxysilane	Octane	0	Tungstophosphoric acid	Only water of crystallization		○	$<10^{-4}$	Not measured	○	Soft
COMPARATIVE EXAMPLE 5	Nafion [®] 11			Sulfonic acid			○	1.2×10^{-1}	$<10^{-4}$	×	

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Replace the paragraph beginning at page 31, line 6 with the following rewritten paragraph:

Solubility of the carbon-containing compound (B) and inorganic acid (C) in each other is decreased, when the former has a low δp and δh value, forming the phase-separated structure shown in Figures 1 and 2. It is observed, when the $(\delta p^2 + \delta h^2)^{1/2}$ value is found for the joint between the compound (B) and three-dimensionally crosslinked structure (A) after it is substituted by hydrogen (i.e., for the skeleton section of the compound (B)) to be correlated with the phase-separated structure, that dissolution starts when $(\delta p^2 + \delta h^2)^{1/2} [[\leq]] \underline{\geq} 7(\text{MPa})^{1/2}$, making it difficult to form the phase-separated structure, whereas the phase-separated structure is formed when $(\delta p^2 + \delta h^2)^{1/2} \leq 7(\text{MPa})^{1/2}$, particularly notably when $(\delta p^2 + \delta h^2)^{1/2} \leq 5(\text{MPa})^{1/2}$, to form the continuous structure of the inorganic acid (C), thus improving conductivity.